

# **Chemical Screening in Emergency Management:**

## **An Overview of DOE O 151.1C**

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# Chemical Screening in Emergency Management

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## OUTLINE

- # Operational Emergencies
  - Characterize *Emergency Management Response*
  - Define *Operational Emergency*
- # Role of Chemical Screening in DOE Emergency Management Hazardous Materials Programs
  - *Identify* Hazardous Chemicals
    - **Health Hazard Ratings**
  - *Exclude* Small Quantities

# Manage/Mitigate Emergencies

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## # *Simple Response*

- Single or few functional response units (fire, medical, HAZMAT, etc.) required

## # *Emergency Management Response*

- Supplement initial functional response units
- Multiple functional units and response skills
- Interfaces, coordination, communication
- Offsite response activities



# Operational Emergency Definition

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Major unplanned or abnormal events or conditions, which . . .

- Involve or affect *DOE facilities/activities*
- Cause or have the potential to cause *serious health, safety or environmental impacts*

# Operational Emergency Definition *(con'd)*

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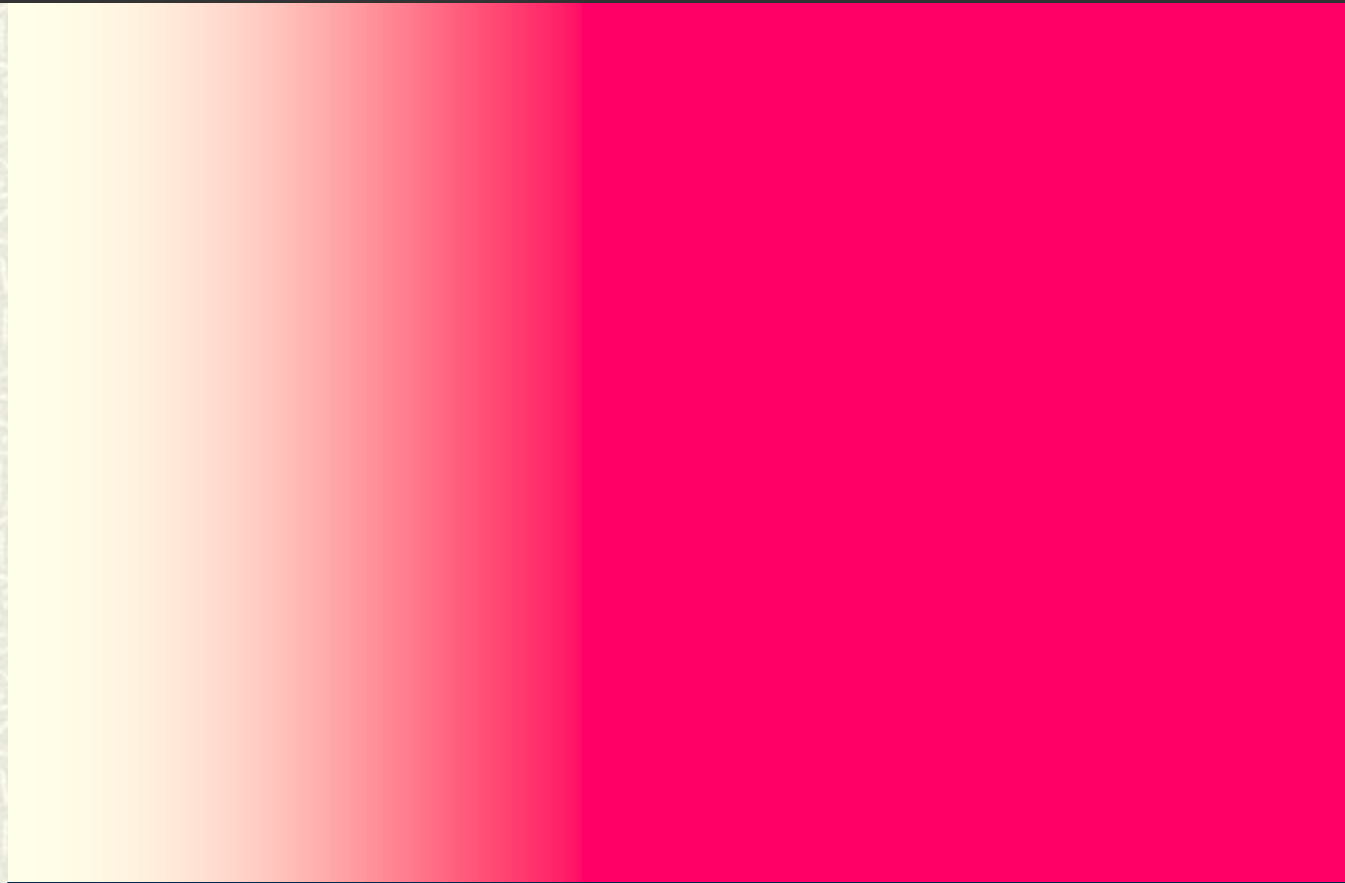
- Require resources from *outside* the immediate/affected area or local event scene to *supplement initial response*

**AND**

- Require time-urgent notifications to initiate response activities at *locations beyond the event scene*

# Health Impacts from Chemical Spills/Releases

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**Local Impacts**



**Widespread Impacts**

# Mitigate/Manage Chemical Spills/Releases





# Mitigate/Manage Chemical Spills/Releases

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**IF . . .**

- *Emergency Management* is needed
  - *Not* just *emergency response* functional units (fire, medical, HAZMAT, etc.)

**THEN . . .**

- It's an *Operational Emergency*



# Mitigate/Manage Chemical Spills/Releases



Local Impacts  
Simple Response



Widespread Impacts  
Emergency Management

# Develop an Emergency Management Hazardous Materials Program

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1. Identify for further analysis hazardous material inventories that may produce *Operational Emergencies* for the facility/activity
2. Analyze in an Emergency Planning Hazards Assessment (EPHA) to determine potential impacts; identify *Operational Emergencies* to be included in the **technical planning basis**
3. Implement an emergency management program that is **“commensurate with the hazards”**

# Develop an Emergency Management Hazardous Materials Program

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The **SCREENING PROCESS**  
identifies for further analysis  
hazardous material inventories  
that may produce  
*Operational Emergencies*



# Chemical Screening Process

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DOE screening *process*:

1. **Identify materials** – Potential to produce impacts and require response measures consistent with the *Operational Emergency* definition

**AND**

2. **Exclude small quantities** - Impacts can be managed effectively by building- or activity-specific safety and response personnel and resources (*Little or no potential for Operational Emergencies*)



# Chemical Screening Process

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## *Step 1: IDENTIFY materials*

- Exclude materials from further consideration based on:
  - Common use by public
  - Dispersibility
  - Health Hazard

# Chemical Screening Process

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## IDENTIFY materials

### # Common Use by the Public

- Exclude if commercially available, packaged for distribution and use by the general public
- Examples:
  - Solvents, inks, adhesives, paints, cleaners
  - Lubricants, fuels, cleaners, resins
  - Proprietary goods (Windex, WD-40, Weed-B-Gone)

# Chemical Screening Process

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## IDENTIFY materials (*con'd*)

### # Dispersibility

- Exclude non-dispersible materials
- Examples:
  - Monolithic solids
  - Non-aerosol size particles ( $>10\ \mu$ )
  - Liquids with low vapor pressure ( $<1\ \text{mmHg}$ )



# Chemical Screening Process

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## IDENTIFY materials *(con'd)*

### # Health Hazard

- *Exclude materials that do **NOT** represent a severe acute health hazard . . . NFPA 704 **Health Hazard Rating 0, 1, or 2***
- *Identifies materials that represent a severe acute health hazard . . . NFPA 704 **Health Hazard Rating 3 or 4***



# NFPA 704

## Health Hazard

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Health Hazard: The capability of a material to cause, *under emergency conditions*, personal injury due to contact with or entry into the body via inhalation, ingestion, skin or eye contact.

- Based on the “inherent physical and toxic properties” of the material
- Does not consider chronic or repeated long-term exposure to low concentrations

# NFPA 704

## Health Hazard Ratings

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- **Health Hazard Rating - 4:**
  - (Possibly) *lethal*
- **Health Hazard Rating - 3:**
  - (Possibly) *serious or permanent injury*
- **Health Hazard Rating - 2:**
  - (Possibly) *temporary incapacitation or residual injury*
- **Health Hazard Rating - 1:**
  - (Possibly) *significant irritation*
- **Health Hazard Rating - 0:**
  - *Offer no hazard beyond that of ordinary combustible materials*

# Sources of Health Hazard Ratings

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- # NFPA-assigned values
- # Values assigned by others using NFPA guidelines
- # Project C Paper (Options for determining health hazard ratings)
- # Assign locally (e.g., SRS system)
- # **If no value available, analyze it**



# Chemical Screening Process

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## *Step 2: EXCLUDE small quantities*

- *Exclude* small quantities of materials identified in *Step 1* that can be managed effectively by safety and local response personnel and resources
  - OSHA defined concept of “Laboratory Scale” quantities (“easily and safely manipulated by one person”)
  - Threshold quantities defined locally in accordance with 29 CFR 1910.1450(b)
  - Consensus agreement that below these quantities there is **little or no potential** for *Operational Emergencies*
  - Exception for “extraordinary toxic hazards”



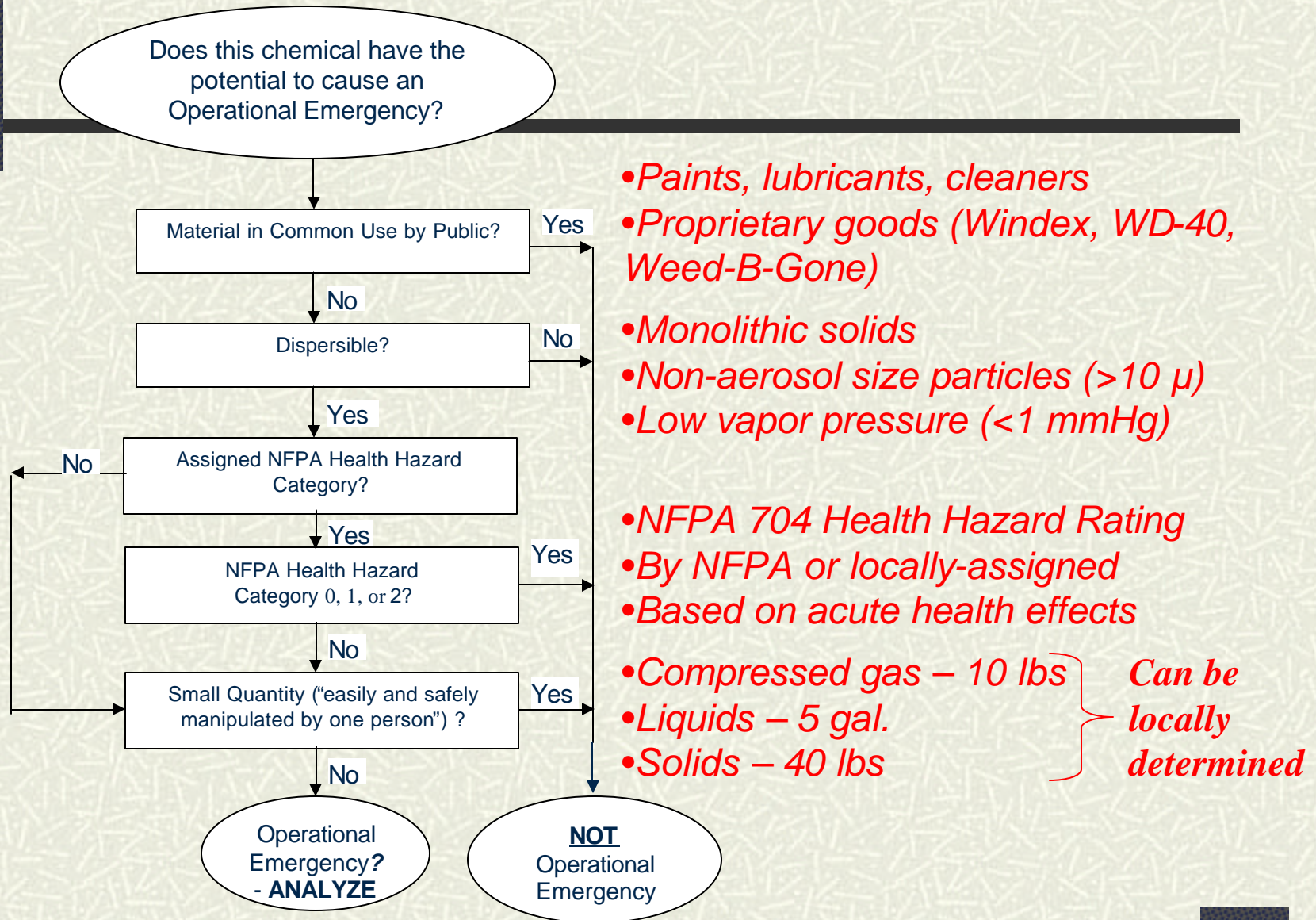
# Chemical Screening Process

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## EXCLUDE small quantities

- # Values that reflect the *intent* of the Order are *approximately*:
  - 5 gallons for liquids
  - 40 pounds for solids
  - 10 pounds for compressed gases
- # *Exception* for materials with high acute toxicity and dispersibility (“*extraordinary toxic hazard*”):
  - 1 pound

# Chemical Screening Process



# Chemical Screening in Emergency Management

**IDENTIFIED  
Chemical Hazards**

Quantities  
easily and  
safely  
manipulated

Analyze  
in EPHA

Offsite  
Resources  
(Federal, Tribal,  
State, Local)

Site-wide  
Resources  
(Supplement)

Facility &  
Local  
Resources  
(Initial)

**Operational Emergencies  
(possible)**

Local Impacts  
Simple Response



Widespread Impacts  
Emergency Management



# Chemical Screening in Emergency Management

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## SUMMARY

# Chemical Screening in DOE Emergency  
Management is a tool to....

- Relegate materials in small quantities to workplace health and safety programs
- Make best use of emergency management resources by *focusing on chemical hazards posing greatest potential for producing Operational Emergencies*



# Chemical Screening in Emergency Management

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## SUMMARY (*con'd*)

- # **“Screened-in”** → *Analyze* in EPHA to determine *Operational Emergency* potential
- # **“Screened-out”** → *Don't analyze* (Little or no *Operational Emergency* potential)